



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,185	11/18/2003	Jeffrey Peter Allen	05046-00035	4141
22910	7590	10/19/2006	EXAMINER	
BANNER & WITCOFF, LTD. 28 STATE STREET 28th FLOOR BOSTON, MA 02109-9601			ECHELMAYER, ALIX ELIZABETH	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/716,185	ALLEN ET AL.
	Examiner	Art Unit
	Alix Elizabeth Echelmeyer	1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 11 August 2006.  
 2a) This action is FINAL.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-15 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-15 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____.                                                         | 6) <input type="checkbox"/> Other: _____ .                        |

## DETAILED ACTION

### ***Response to Amendment***

1. This Office Action is in response to Applicants' reply filed August 11, 2006. Claims 1, 3, 9 and 11 have been amended. Claims 1-15 are rejected finally for the reasons given below.

### ***Claim Rejections - 35 USC § 112***

2. The rejection of claims 3 and 11 is withdrawn in light of the amendment.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlstrom (US Patent Number 7,029,784) in view of Franklin et al. (US Pre-Grant Publication 2002/0022170), Baker (US Patent Number 4,877,693) and Beusker et al. (US Patent 2,925,456).

Carlstrom teaches a flow field plate with at least two interlocking layers forming internal channels between them. The first layer includes first lands and first channels. The second layer includes second lands and second channels. The plates interlock to

Art Unit: 1745

form a series of third channels. The first channel is intended to carry fuel and the second to carry oxidant (abstract; Figure 1; column 3 lines 1-24).

Although Carlstrom does not explicitly teach the edge areas at the opposing ends of the plates, the plates are not infinite and therefore end at some point. At that point, they form edge areas.

Regarding claims 1 and 9, Carlstrom fails to teach internal fuel manifolds, either a single one or a plurality of manifolds. Franklin et al. teach either a single or multiple manifold(s) for the delivery and removal of reactants and reactant products to and from the separator plate (abstract; claim 2 of Franklin et al.).

The manifolds of Franklin et al. would improve the separator plate of Carlstrom by allowing for delivery and removal of reactants and reactant products to and from the separator plate.

Therefore, it would have been obvious to one having ordinary skill in the art to combine the manifold(s) of Franklin et al. with the separator plate of Carlstrom in order to aid delivery and removal of reactants and reactant products.

Carlstrom also fails to teach the turnaround plenum in fluid communication with the center flow channels and the anode flow channels.

Baker teaches the passage of fuel through fuel chambers that are coupled to entry ports of anode chambers. The fuel passes through the first chamber, enters a manifold, and then makes a u-turn into the anode passages (Figure 1; column 3 lines 1-29).

Art Unit: 1745

The turnaround plenum of the instant application and the manifold of Baker solve the same problem of directing fuel from a first chamber to a second chamber, without contamination, where it can facilitate the reaction of the fuel cell.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the manifold and port coupling of Baker in the separator plate of the Carlstrom in order to direct fuel from one chamber to another.

As for the nesting of the flow field plates to define center flow channels, Carlstrom fails to teach that a height of the ribs on the first plate is less than the height of the ribs on the second plate.

Beusker et al. teach a separator having two corrugated elements that are nested together to create passages between (Figure 3; column 2 lines 57-59). As is seen in Figure 3, the height of the ribs in one plate must be higher than the height of the ribs in the other plate in order to allow for passage between the plates.

Beusker et al. further teach that, since both elements are corrugated, they are kept together more effectively (column 2 lines 57-59).

Regarding claims 2 and 10, Carlstrom in view of Franklin et al. teaches the separator plate assembly but fails to teach the use of a catalyst in the first fuel flow passages.

Baker teaches that the first fuel flow passages, discussed above, contain a catalyst. Baker further teaches that the internal reforming of fuel is advantageous

Art Unit: 1745

because it eliminates the need for external fuel processing, thereby increasing the efficiency of the system (column 1 lines 23-29).

The use of a catalyst in the first fuel flow chamber of the separator plate taught by Carlstrom, Franklin et al., and Baker is advantageous because it eliminates the need for external fuel processing and increases the efficiency of the system.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the catalyst to the first fuel passage chambers of the separator plate of Carlstrom, Franklin et al., and Baker in order to increase the efficiency of the system by eliminating the need for external fuel processing.

As for claims 3 and 11, the turnaround portion taught by Baker includes an input port and manifold fluidly connecting the first fuel flow passage with the second.

With regard to claims 4 and 12, Carlstrom in view of Franklin et al. teach a separator plate that is bent over at the ends to support the seals (Franklin et al., [0083]).

Regarding claim 5, Carlstrom in view of Franklin et al. teaches the multiple manifolds, or segments, that internally connect to the first and second sets of passages.

As for claims 6 and 13, Carlstrom in view of Franklin et al. and Baker is silent on whether the internal fuel manifold(s) are substantially parallel to a flow path of the bipolar plate. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the manifold(s) parallel to the flow path of the bipolar plate, since it has been held that rearranging parts of an invention, for example rearranging the relationship between the manifolds and the flow passages, involves only routine skill in the art. MPEP 2144 (VI).

5. Claims 7, 8, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlstrom, Franklin et al., Baker and Beusker et al. as applied to claims 1 and 9 above, and further in view of Jones (US Patent Number 6,007,933).

The teachings of Carlstrom, Franklin et al., Baker and Beusker et al. as described above are incorporated herein.

Carlstrom, Franklin et al., Baker and Beusker et al. teach the separator plate but fail to teach the plurality of flat wires on the surface of the first sheet and an electrode positioned on the wires.

Jones teaches wires disposed between the bipolar plate and electrode to distribute reactants and products and to provide deformability and resiliency in the cell (column 2 lines 15-21).

The combination of the wires and electrode of Jones with the separator plate of Carlstrom, Franklin et al., Baker and Beusker et al. is desirable because it helps with the distribution of reactants and products and provides deformability and resiliency in the cell.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the wires and electrode of Jones with the separator plate disclosed above in order to distribute the reactants and products and to provide deformability and resiliency in the cell.

***Response to Arguments***

6. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground of rejection as necessitated by amendment.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone

Art Unit: 1745

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer  
Examiner  
Art Unit 1745

aee

*Susy Tsang Foster*  
**SUSY TSANG-FOSTER**  
**PRIMARY EXAMINER**